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(54) Roof tiling systems

(57) Roofing slates 20, 22 are clipped together by clips comprising a clip portion which clips to and is slidable on a side edge formation 28 of an upper roof slate 20 and a tongue portion which underlies the top edge 24 of an adjacent lower slate 22 in the roof so that fixing of the top edge of the lower slate has the effect of holding down the side edge of the upper slate. As shown, the clip may be a flat plate with a C-shaped clip upstanding therefrom, and the nail 36 which holds the lower slate 22 may penetrate the flat plate portion.

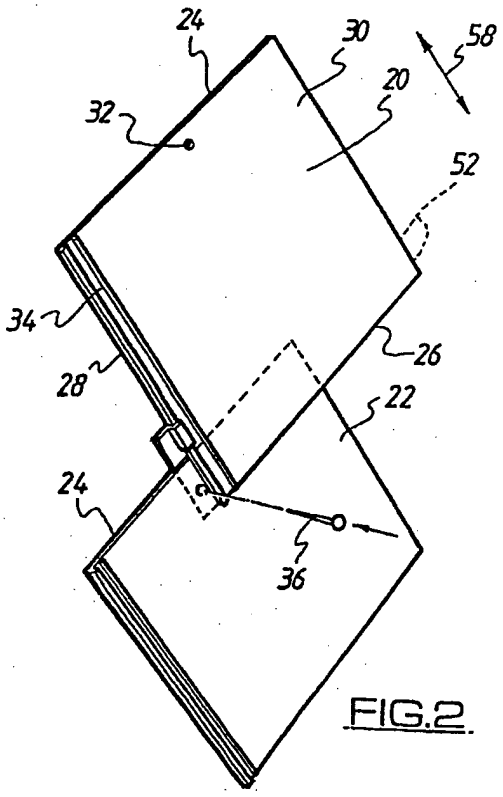

FIG.2

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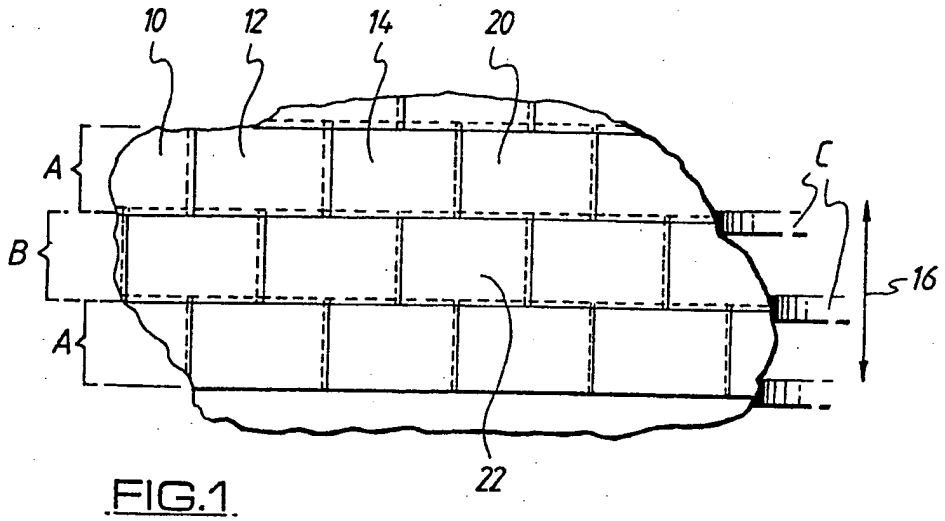

FIG.1

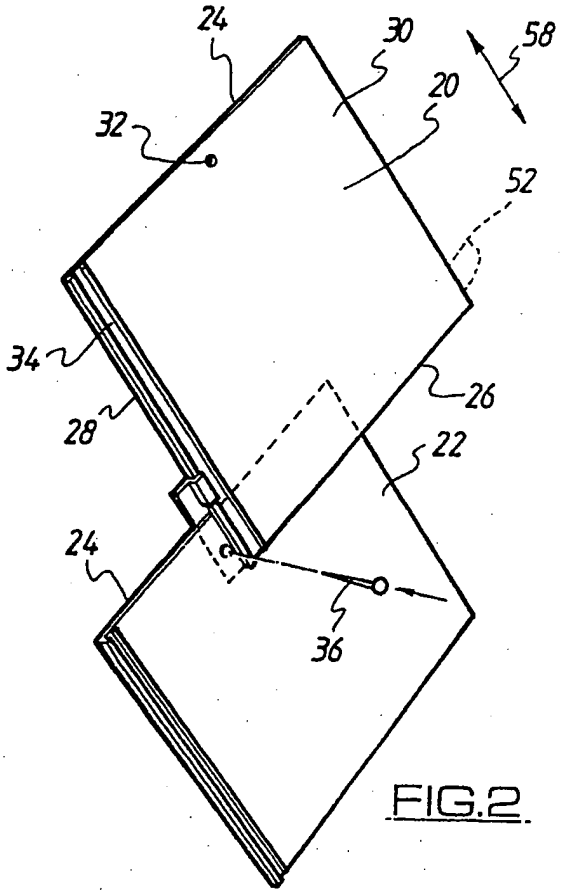

FIG.2

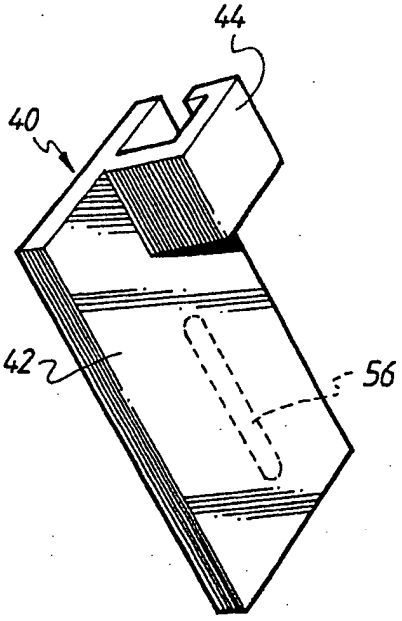

FIG.3

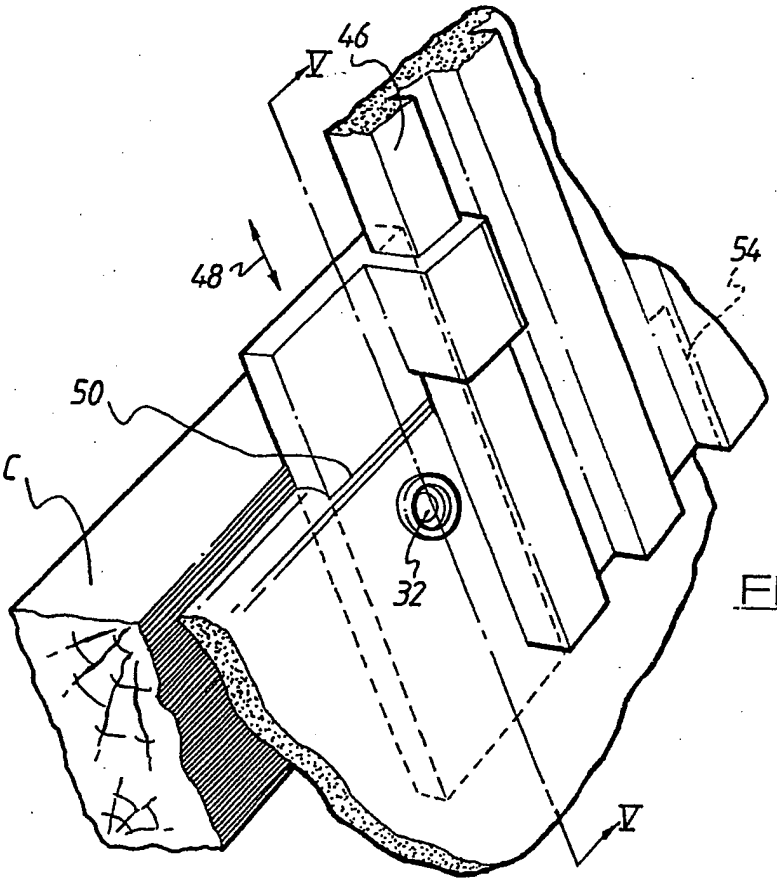

FIG.4

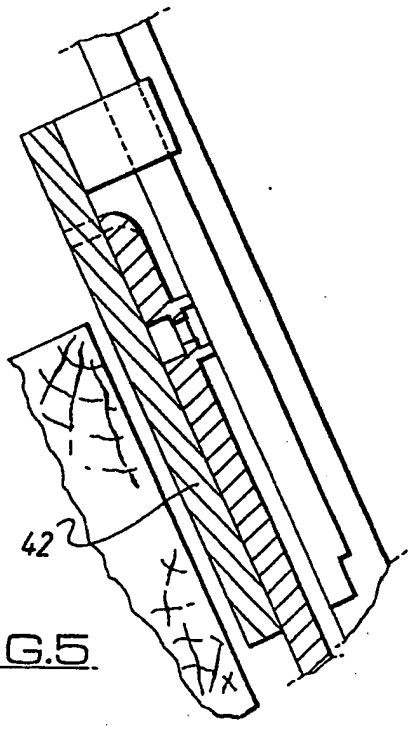

FIG.5

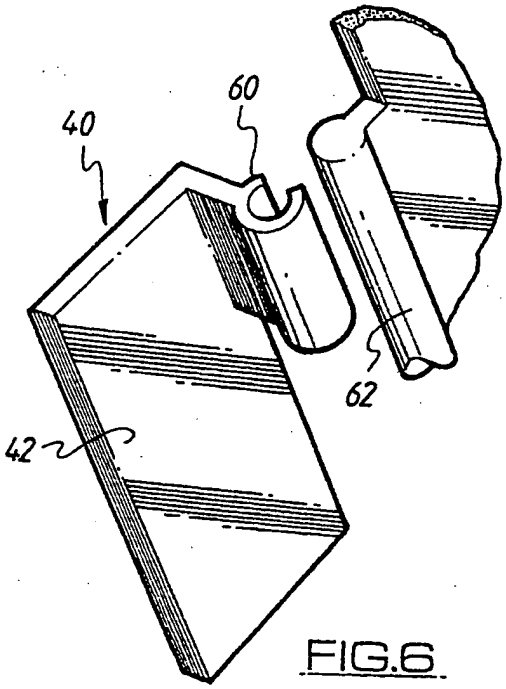

FIG.6

Improvements Relating to Roof Covering Systems

This invention relates to roof covering systems which employ tiles, slates, panels, shingles or the like, all hereinafter collectively referred to as "tiles" in the interests of simplicity.

As is well known, in the covering of a roof using tiles, the tiles are arranged in horizontal rows, with the tiles of alternate rows being staggered in order to ensure the waterproofness of the tile covering. Typically, the tiles are connected by fasteners e.g. nails to the parallel horizontal timber battens of the roof frame, suitable apertures or recesses being provided or formed in the tiles for the receipt of the fasteners.

In order to permit the tiles to be applied to a roof as quickly as possible, it is desirable that the fixing method should be made simple and efficient, and various attempts have already been made to design roofing tile systems, permitting the easy application of the tiles to take place.

In one system, as disclosed in British Patent No. 2051174 the tile is provided along a top edge with a fastener aperture, and along a side edge with a plurality of apertures so that when each tile of a higher row is laid, the series of apertures will overlie the single aperture of a tile in the next lower row and the fastener can be passed through one of the series of apertures in the tile side edge, and the single aperture in the top edge of the tile which is overlapped by the upper tile. The series of apertures is provided to enable the upper tile to be adjusted in a direction up and down the roof to give the required degree of overlap between the rows, and also to take account of the fact that the spacing between the battens differs at least to a small

extent from roof to roof and also within the battens of a single roof. A disadvantage of this system is that it is difficult to replace a single tile in a roof covering, should that tile for any reason require to be replaced due to the fact that the fasteners pass through two tiles, and each tile is fastened in two locations.

In another system, as disclosed in British Patent No. 2152964 instead of a series of apertures being provided in a side edge of the tile, a separate clip having a single aperture is adapted to be connected to the tile edge, and the clip can be moved along the edge and positioned in the installation of the tiles so that the aperture in the clip overlies the aperture in the top edge of the tile when fixing is to take place, and by this means the tiles can be positioned in an adjustable manner up and down the roof to take account of the variations above referred to. The use of clips in this fashion makes is easier for single tiles in a roof cladding to be removed and replaced, but the particular clip which is used is formed in metal and is of relatively complicated design.

The function of the series of apertures in the case of the former prior art arrangement, and the use of the clip in the second prior art arrangement is to provide that not only will the top edge of the tile be held to the batten, but also that the side edge of the tile will be held down mitigating against tile lift which tends to take place in windy conditions.

The present invention is concerned with a roofing tile system wherein clips are again used for tile edge retention.

In accordance with the present invention, clips are used in a roof tile system connecting the top edge of a lower tile to

the overlapping side edge of an upper tile, wh rein the clip is connected to or connectable to the said upper tile side edge, and has a tongue portion which underlaps the upper edge of the lower tile.

To provide for the adjustability of the upper roof tile position relative to the lower tile, the clip may be slidable along the edge of the upper tile, and/or may be provided with a tongue of sufficient length.

The clip portion can in some instances be formed integrally with the upper tile, in which case the tongue portion would have to be of sufficient length, and would also preferably require to be formed in sections which can be broken off so as to reduce the tongue length to provide for the said adjustability of the position of the upper tile relative to the lower tile.

In the preferred case, the clip is adapted to be removably connected to the side edge of the upper tile and be slidable thereon, and the tongue portion which underlies the upper edge of the lower tile is adapted to underlie an aperture or location for receipt of a fastener which passes through not only the upper edge of the lower tile, but also through the said tongue. This arrangement provides a means of indicating that the clip has been properly applied insofar as in the event of a dispute as to whether or not the tiles have been properly applied to a roof structure, there will be evidence that the clip has been properly applied if it contains an aperture therein provided by the passage therethrough of the fastener.

The clip is preferably formed in plastics material suitably by inj ction moulding. It may be provided on an edge of the tongue with a C-shaped clip portion for clipping to the edge

of the upper tile, which edge may be appropriately shaped, the C-shaped portion lying out of the plane of the tongue by an amount sufficient to accommodate the thickness of the upper edge of the lower tile.

As will be appreciated, such a clip will be used in the roof cladding in each instance where an upper tile overlaps a lower tile, and the upper tile is to be anchored to the lower tile to resist wind lift.

Whilst the clips can be used with any suitable tile, they are particularly useful in connection with prefabricated synthetic slates which are produced from a mixture of synthetic resin and granular material such as slate particles and which are formed by a moulding operating, because in the moulding operation appropriate edges and ribs can be formed in the tiles to ensure that the tiles will perform the other functions to be performed such as defining rain channels for improving the waterproofness of the tiles. For example the tiles may be configured as described and illustrated in detail in European Patent Application No. 0396380, except that the fixing apertures in the side edge projection are omitted.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, wherein:-

Fig. 1 is a side view of a section of a roof provided with a cladding of roof tiles;

Fig. 2 is a perspective view of a pair of the roof tiles shown in Fig. 1, illustrating how the tiles are fixed to roof battens;

Fig. 3 is a view to an enlarged scale of a clip used in connection with the fixing of the tiles as shown in Fig. 2;

Fig. 4 is a view to an even further enlarged scale showing how the clip of Fig. 2 interfits in relation to the tiles coupled thereby;

Fig. 5 is a sectional view taken on the line V-V in Fig. 4; and

Fig. 6 shows in elevation similar to Fig. 3 an alternative form of clip.

Referring to the drawings, roof cladding as shown in Fig. 1 is made up of a plurality of tiles 10, 12, 14 and so on which are arranged in rows A and B, rows A alternating with rows B and B in an up and down direction in the roof as indicated by arrow 16. The individual tiles 10, 12 and so on may be natural slates, or may be as is preferred synthetic moulded slates designed to overlap in a particular fashion as will be described in more detail for providing an effective weatherproof covering for the roof. Also, each tile 10, 12, 14 as illustrated may in fact be a panel having on the outer surface thereof moulded shapes representative of a plurality of individual tile segments.

The tiles in the upper rows overlap the tiles in the lower rows in order to shed water, as is conventional, but in addition, the individual tiles in each row are arranged in overlapping arrangement so that the right hand margin of each tile overlaps the left hand margin of the adjacent tile.

In order to fix the tiles to the roof battens, which are indicated by reference C, fastening devices in the form of nails are preferably used. To this end, the tiles 10, 12,

14 etc must be provided with apertures to receive such nails, and the apertures may be pre-formed when the tiles are manufactured, or may be created simply by driving the nail through the tile when the tiles are being laid.

Typically, tiles are laid on a roof bottom row first, and the individual tiles are laid in a direction from right to left of the roof surface, although with appropriate design tiles could be laid from left to right. The tiles illustrated in Fig. 1 are laid from right to left on an individual tile basis, and upwardly of the roof on a row basis.

The present invention is concerned with the fastening of the tiles to the roof battens,in order that they will be as securely held as possible against wind lift, and so that fixing can be effected in a simple manner.

If reference is now therefore made to Fig. 2, two tiles 20 and 22 are shown. These two tiles are taken from adjacent rows, tile 22 as shown in Fig. 1 being in the row B, and tile 20 being in the row A above row B so that tile 20 overlaps tile 22, but is offset in relation thereto as can be seen clearly in Fig. 2. The tiles 20 and 22 are of course identical, and each tile has a top edge 24, a bottom edge 26 and left and right hand side edges 28 and 30. Adjacent the top edge 24 is provided a nail receiving aperture 32, and at the left hand side edge 28 there is provided water draining channel means 34 and to the underside of right hand edge 30 there is not shown, a recess which enables the interfitting of the channels 34 and the recess so that the tiles in each row have their upper surfaces substantially lying in the same plane, but so that any water falling in the vicinity of the side overlapping joint will drain along the drain channels 34 and fall onto the next underlying tile 22, and eventually will cascad from the roof surface.

The nail 36 shown in Fig. 2 serves to anchor the tile 22 to the underlying roof batten C, but additionally, according to the embodiment of the invention, the nail 36 also serves as a means for holding the upper tile 20 against lifting by wind loading. There is a tendency for tiles which are fixed only along their top edges 24 to lift when wind enters the underside of the tile past the lower edge 26. The holding effect is achieved by means of a clip of the form shown in Fig. 3, such clip being indicated by reference 40. The clip comprises essentially a flat plate portion 42 and an upstanding hook portion 44. The hook portion 44 is for hooking around one of the formations 46 (Fig. 4) on the left edge 28 of tile 20 so that the clip when so hooked can be slid on said formation 46 as indicated by reference 48 in Fig. 4. The plate portion also shown in Fig. 4 can be caused to underly the top edge 24 of the lower tile 22, and the tile may be rebated as indicated by reference 50 for this purpose. When the clip is thus in position, the nail 36 can be driven through aperture 32 and through plate portion 42 and eventually into the batten C in order to hold not only the top edge 24 of the lower tile 22, but also the left hand side 28 of the upper tile 20. It can be provided for the holding of the right hand edge of the tile 30 that a projection 52 (see Fig. 2) is provided on each tile, such projection fitting into for example a slot 54 provided in the side of one of the channels 34 as shown in Fig. 4.

The clip 40 may suitably be of plastics material or it may be metallic, and it may be provided with an aperture or slot 56 as shown in Fig. 3 for the reception of the nail 36. This would preferably be required if the clip were of a hard metallic material. As long as the clip is of a material through which the nail can be driven however it is not necessary to provide the slot 56.

It will be understood that the arrangement described permits the upper tile 20 to be positioned within a range of adjustment up and down the roof as indicated by reference 58 in Fig. 2 relative to the lower tile 22, and the clip can be slid along the formation 46 so as still to underly the lower tile top edge 24 to ensure that the tiles will be interlocked.

It is not necessary incidentally that the plate portion 42 of the clip should underly the hole 32 in the top edge of the lower tile. The mere positioning of the plate portion 42 to the underside of a tile top edge will be sufficient to hold the upper tile left hand edge in position to resist wind lift, but it is of advantage that the plate portion 42 should underly the aperture 32, as the puncturing of the plate portion by insertion of the nail 36 provides a means whereby any dispute as to whether or not the tiles have been properly installed may be easier to settle.

Fig. 6 shows an alternative arrangement for the clip 40. The plate portion 42 is again provided, but the hook portion 44 is replaced by a C-shaped clip portion 60 which is adapted to clip onto an appropriately formed guide rail portion 62 provided on the left hand edge of the tile.

A simple and effective tile clipping system is therefore provided for the application of roofing tiles to a roof framework.

The individual tiles may have other formations of the type described in European Patent Application No. 0396380 the disclosure of which is incorporated hereinto by reference.

For example, the water baffles 18 as described in Fig. 1 of said European Application could be provided in the present

invention and could be made continuous or connected to extend completely across the tile so as to provide an even more effective water baffle due to the fact that the lug 23 in the tile in said European Application is omitted in the present invention.

CLAIMS

1. A roofing tile system wherein clips are used for connecting to top edges of lower tiles to overlapping side edges of upper tiles, wherein each clip is connected to a said upper tile side edge, and has a tongue portion which underlaps the upper edge of a said adjacent lower tile.

2. A system according to claim 1 wherein each clip is slidable along the edge of the upper tile.

3. A system according to claim 1, wherein each clip is formed integrally with the upper tile, and the tongue portion is of sufficient length, and is formed in sections which can be broken off so as to reduce the tongue length to provide for the said adjustability of the position of the upper tile relative to the lower tile.

4. A system according to claim 2, wherein the clip is removably connected to the side edge of the upper tile and is slidable thereon, and the tongue portion which underlies the upper edge of the lower tile is adapted to underlie an aperture or location for receipt of a fastener which passes through not only the upper edge of the lower tile, but also through the said tongue.

5. A system according to claim 1, 2 or 4, wherein the clip is formed in plastics material suitably by injection moulding.

6. A system according to claim 5, wherein the clip is provided on an edge of the tongue with a C-shaped clip portion for clipping to the edge of the upper tile, the C-shaped portion lying out of the plane of the tongue by an amount sufficient to accommodate the thickness of the upper

edge of the lower tile.

7. A system according to any preceding claim, wherein the tiles are prefabricated synthetic slates which are produced from a mixture of synthetic resin and granular material such as slate particles and which are formed by a moulding operating, and in the moulding operation appropriate edges and ribs are formed in the slates to ensure that the slates will perform the other functions to be performed such as defining rain channels for improving the waterproofness of the tiles.

8. A system according to Claim 7 wherein the slates are as described and illustrated in European Patent Application No 0396380, except that the fixing apertures in the side edge projection are omitted.

9. A roofing tile system substantially as hereinbefore described with reference to the accompanying drawings.

10. A roofing tile clip for use in the roofing tile system according to any one of the preceding claims.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

9127512.3

Relevant Technical fields

(i) UK Cl (Edition J) E1D DLEQGD, DLEHG, DLEKG, DF147, DF115

(ii) Int Cl (Edition 4) E04D

Search Examiner

J D CANTRELL

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

10 MARCH 1992

Documents considered relevant following a search in respect of claims 1-10

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 308428 SMALL	1,10

Category	Identity of document and relevant passages	Relevant to claim(s)

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